EXPLOITATION OF PATENTS AS COLLATERAL BY SMALL AND MID-SCALE ENTERPRISES

– WHAT EMERGING ECONOMIES SHOULD LEARN FROM THE UNITED STATES –

by Andreea Costa

LL.M. Capstone Thesis

SUPERVISOR: Professor Tibor Tajti

Central European University

June 7, 2020

TABLE OF CONTENTS

ABSTRACT

The use of patents and other forms of intellectual property (hereinafter: IP) as collateral for the purpose of securing a credit from banks, non-banking financial organizations or other financiers has become a common practice in the U.S. Typically, lenders require their loans to be secured by tangible assets in order to sell the collateral on the market upon the borrower's default and get paid from the price received. Small and mid-scale enterprises (hereinafter: SMEs), especially start-up enterprises, however, usually lack tangible assets that could be offered as collateral what makes affordable financing unavailable for them.

The financing difficulties then result in the inability of operating and growing their business as well as developing and exploiting their innovative ideas. Often their most valuable assets are patents, which potentially could serve as collateral to obtain financing if a developed legal framework and a receptive business environment is in place. These preconditions, however, as a rule are not prevailing in emerging systems. Hence, in order to incentivize lenders to extend credits at favorable terms and conditions, they must first learn how patents can be exploited as collateral, what presumes a transparent and predictable secured transactions system. Policy-makers, on the other hand, should understand that the existence of a system that makes easy and cheap use of patents as collateral is the token of innovation and ultimately economic development.

It is an exacerbating factor, as best demonstrated by U.S. practices as the system having one of the most developed secured transactions laws in the world, that the interaction of secured transactions law with IP rights is complex and, in many respects, idiosyncratic. Understanding the issues that arise out of and acknowledging the economic potential of patents thus appear to be challenging, especially for emerging economies which generally lack a strong regulatory framework of secured

transactions laws. Often development of IP law is an issue as well, what presumes parallel modernization of these two branches of law.

To address the above challenges, this thesis scrutinizes the relevant laws, cases, and practices of the U.S. from both a legal and empirical point of view in order to forge recommendations for emerging markets with the ultimate goal of reducing the risk associated with patent collateralization and through that making affordable financing to SMEs possible. Besides U.S. law, the objective of United Nations Commission on International Trade Law's (hereinafter: UNCITRAL's) Legislative Guide on Secured Transactions and its Supplement in Security Rights in IP is to make affordable credit more available to IP rights holders, thus enhancing the value of IP rights as collateral for a loan. Within this thesis, UNCITRAL's Legislative Guide is the other source of law serving as a model of an international instrument for reform-oriented jurisdictions. The thesis will substantiate as well that emerging markets need to implement prescriptive regulations that would better guide financiers and SMEs in exploiting patents for financing purposes.

LIST OF ABBREVIATIONS

EU	European Union
IP	Intellectual property
IPR	Intellectual property right
NBFC	Nonbank financial company
NBFCs	Nonbank financial companies
SBA	United States Small Business Administration
SMEs	Small and mid-scale enterprises
UCC	Uniform Commercial Code
UNCITRAL	United Nations Commission on International Trade Law
U.S.	United States of America
USPTO	United States Patent and Trademark Office

INTRODUCTION

i. PATENTS AND CREDIT FINANCE: THE PRACTICE OF USING PATENTS AS COLLATERAL

The use of intellectual property-based finance is becoming more popular especially in the United States, where companies have made efforts to use intellectual property, particularly patents, to access financial resources.[1] The form of intellectual property-based finance I will take a look at in the thesis is patent-backed lending. The relationship of secured transactions law[2] with intellectual property (hereinafter: IP) rights is intricate and varies among jurisdictions. For example, some least developed legal systems do not allow for the creation of non-possessory security interests over personal property even today.[3] Yet in some other, use of IP rights as collateral is extremely burdensome or the rules are obscure. For these jurisdictions, security devices are hard to use in connection with intangible property such as patents.[4] Moreover, national IP laws of emerging countries often are underdeveloped as well making their efficient exploitation next to impossible. Therefore, the scrutiny and understanding of the nexus of IP and secured transactions law as one of the most burning issues in emerging systems is justified.

Credit is a crucial source of financing for ventures of all sizes. However, small, and mid-scale enterprises (hereinafter: SMEs) are usually lacking tangible assets that can serve as collateral and therefore face difficulties obtaining debt finance. Small businesses are usually small incubators of

[1] M.A. Lemley, *Reconceiving patents in the age of venture capital* (Journal of Small and Emerging Business Law 2000) Vol. 4, at 137.
[2] Secured transactions law refers to the law governing those transactions that pair a debt with a creditor's interest in the secured property. See Adam Hayes, *Article 9* (Investopedia) https://www.investopedia.com/terms/a/article-9.asp , accessed 2 June 2020.
[3] Hereinafter referring to the United States designation, while the Germanic concept of personal property is referred to as movable property.
[4] Andrea Tosato, *The UNCITRAL Annex on security rights in IP: a work in progress* (4JIPLP 2009), at 743.

innovative ideas. The difficulties of these businesses to access financing results in inability of operating their business, innovate for new ideas and foster employment as well as growth. In other words, small businesses are a vehicle of innovation. Their most valuable assets are not equipment or inventory, but rather ideas, content, innovative technology, know-how's, and other intellectual property. The intangible property – such as patents – can serve as collateral to obtain financing, whereas lenders must learn to accept this type of property as collateral in order for credits to be extended to small businesses and, most importantly, to foster the innovation process on the market.[5] In order for lenders to accept patents as collateral, they must first understand the potential of patents and make active usage of their value. These are the key economic reasons why this topic deserves to be explored, which appear to be particularly problematic in emerging economies.

ii. RESEARCH QUESTION, CHOICE OF JURISDICTIONS AND JUSTIFICATION

The above-sketched reasons, I believe, properly show why the topic of collateralization of patents is important to address. Besides, the literature on patents as collateral is still limited. Reasons for this silence vary, there is a lack of empirical data on loan agreements extended based on the strength of patents as well as a difficulty to quantify the existing data on the patent related activities.[6] True, efforts have been made by the United Nations Commission on International Trade Law (hereinafter: UNCITRAL) to raise awareness of the relevance of IP assets such as patents. UNCITRAL has issued in 2010 its Legislative Guide on Secured Transactions[7] to serve as a Model

[5] Xuan-Thao Nguyen, *Financing Innovation: Legal Development of Intellectual Property as Security in Financing, 1845-2014* (Ind L Rev 2015), at 509.
[6] Leonardo Andaloro, *Patent as collateral – An empirical analysis on security agreements and patent value* (ResearchGate MA 2016), at 5.
[7] The UNCITRAL Legislative Guide on Secured Transactions (2010), < https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiz_pqd0MrpAhXPxIsKHXafCeYQFjAAegQIBBAB&url=https%3A%2F%2Fwww.uncitral.org%2Fpdf%2Fenglish%2Ftexts%2Fsecurity-lg%2Fe%2F09-82670_Ebook-Guide_09-04-10English.pdf&usg=AOvVaw0uSxxcNdFJdDj6JgY10qoS > accessed 3 May 2020.

Law especially for emerging markets for the purpose of harmonization of international legislation. Even though the Guide applies to IP rights, it was not "prepared with special intellectual property law issues in mind."[8] Hence, UNCITRAL has issued a Supplement on Security Rights in IP law[9] to address specific solutions on the issue of collateralization of IP rights in 2011. I have restricted my research on patents as a form of intellectual property, since patents possess unique features that make them complicated to analyze. The possession of tangible goods is easy to establish, while patents are on the one hand intangible in nature and on the other hand can be shared by multiple parties through non-exclusive licenses that do not constrain the original owner to profit from the patent.[10] Given the above considerations, the question of patents as collateral becomes therefore highly interesting.

This thesis chooses to discuss patent collateralization from the point of view of the United States and draw lessons for emerging markets for several reasons. In the United States there is a strong emphasis on the importance of patent-backed loans since the amount of unexploited intangible collateral is immense. According to available empirical data, the investment in intangible assets including patents is estimated at 1.2 trillion dollars per year.[11] Further, debt financing is attractive to shareholders because they can avoid the dilution of their shares and therefore tend to choose debt financing over equity financing.[12] Also, the patent-backed loan has an entire industry that encourages the usage of IP, whereas the patent intermediaries are playing a huge role in assuring

[8] Official Records of the General Assembly, Sixty-first Session, Supplement Nr. 17 (A/61/17), at 82.
[9] UNCITRAL Legislative Guide on Secured Transactions: Supplement on Security Rights in Intellectual Property (United Nations, 2011) < https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwj8ldOO4O_pAhWsl4sKHaZJAgcQFjABegQIBBAB&url=https%3A%2F%2Fwww.uncitral.org%2Fpdf%2Fenglish%2Ftexts%2Fsecurity-lg%2Fe%2F10-57126_Ebook_Suppl_SR_IP.pdf&usg=AOvVaw246eV0PufsKCWVsWbLfVq7> accessed 3 May 2020.
[10] Allen W. Wang, *Rise of the Patent Intermediaries* (Berkley Technology Law Journal 2010), Vol. 25, at 163.
[11] C. A. Corrado, *Intangible capital, and economic growth* (NBER Cambridge MA 2006), at 26.
[12] Andaloro (n 6), at 22.

appropriate regulatory changes and furthering the goals of the patent system.[13] Lastly, start-up enterprises having at least one patent or a patent portfolio are usually bringing more innovation on the market in comparison to start-ups which are financed by private equity financing and venture capital.[14]

Therefore, I believe it is justified to draw lessons of patent-collateralization for emerging markets by using U.S. practices as milestone examples. Emerging markets in this context refer to those economies possessing moderately developed financial and regulatory tools, especially those with a less developed secured transactions law. Emerging markets are usually defined by a typically poor information environment, where creditors choose to apply due to these considerations harsher credit conditions.[15] Emerging markets are also conditioned by information asymmetries which affect the terms of a loan.[16] As Leland and Pyle perfectly state, "the uncertain, idiosyncratic and intangible nature of research and innovation activities creates wide information gaps that constitute relevant obstacles to the financing of innovative firms".[17] Hence, emerging markets need to eliminate information asymmetry problems and credit constraints for small innovative ventures. Besides that, emerging markets need to develop proper secured transactions laws, focusing on the creation of a simplified filing system as in the example of the U.S. UCC-1 financing statement[18], allowing for an uncostly perfection of security interests with clear priority rules both within and outside bankruptcy proceedings based on which enforcement occurs efficiently.

[13] Wang (n 10), at 165.
[14] Andaloro (n 6), at 26.
[15] Federico Caviggioli et al, *Lender's selection capabilities, patent quality, and the outcome of patent-backed loans* (Industrial and Corporate Change 2019), at 5.
[16] ibid.
[17] H. E. Leland and D. H. Pyle, *Information asymmetries, financial structure, and financial intermediation* (The Journal of Finance 1977), Vol. 32, at 373.
[18] Hereinafter referring to the financing statement describing the collateral, filed under UCC Article 9 rules with the appropriate state office.

iii. THESIS STRUCTURE AND RESEARCH METHODOLOGY

The purpose of this paper is to scrutinize the usage of intellectual property in the form of patents as collateral as an innovative way of maximizing the benefits of patents for furthering access to credit and thus, for ending the aversion of patents as collateral.[19]

In Chapter One I will explain the key features of patents and briefly compare them to other intellectual property rights and to tangible collateral as well. This chapter will look at patent-backed lending with a reference to the U.S. case of *Railex Corp. v. Joseph Guss & Sons, Inc.*[20] This case illustrates that small ventures rely on assets such as patents for the purpose of accessing financing. Besides of the collateralization of patents, the reasons of the underutilization of patents as collateral will be examined for the purpose of drawing lessons for emerging markets in terms of the role of specialized intermediary financing institutions.

The historical background of the usage of patents as collateral will be traced in Chapter Two, starting from 19th century intellectual property mortgages with the famous U.S. case of *Waterman v. Mackenzie*[21], moving afterwards to Secured Transactions Law and the promulgation of the Uniform Commercial Code (UCC) Article 9. Further, I will be assessing the formal preconditions for using patents as collateral both from the perspective of UCC Article 9 and the relevant patent law, backed up by the analysis of relevant court decisions. The overview of the general rules of perfecting security interests in patents draws several conclusions. This part will analyze proposals for simplifying, integrating, and harmonizing the process for perfecting security interests in patents as collateral. These serve as vital lessons for emerging markets which find themselves in the

[19] Laurent Manderieux, *Secured Transactions as a Tool for Better Use of Intellectual Property Rights and of Intellectual Property Licensing (including Patent Licensing)* (Unif L Rev 2010), Vol.15, at 447.
[20] *Railex Corp. v. Joseph Guss & Sons, Inc*. [1967], 40 F.R.D. 119.
[21] *Waterman v. Mackenzie* [1891], 138 U.S. 252.

process of developing both their IP laws and their secured transactions laws. A proper perfecting mechanism of security interest serves not only as a tool for a better use of patents, but most importantly, it fosters values such as clear priority rules and efficient enforcement mechanisms.[22]

The Third Chapter will focus on the risks of usage of patents as collateral from different point of views. By pledging the patent as collateral for the securitization of a loan, a debtor, especially a small enterprise, in case he fails to meet its initial commitments, faces the complete disappearance from the market. Besides the risks faced by the defaulting debtor, the enforcement of the secured creditor's interest might also seem ambiguous. Here I will be discussing the foreclosure and sale of patent collateral and draw relevant lessons for emerging markets by referring to the case of *Sky Technologies v. SAP*.[23] The decision is crucially important, since it expresses the functionality of modern secured transactions law and the importance of UCC Article 9, allowing a channel of financing for SMEs and therefore encouraging secured financing and innovation. Additional risks of the secured creditor such as infringement liability and patent licensing will be asserted, with a short referral to relevant case law.

Lastly, the conclusion will summarize the key points and aspects and canvas lessons for emerging markets with a special focus on SMEs.

[22] Peter S. Menell, *Bankruptcy treatment of Intellectual Property Assets: An Economic Analysis* (Berkley Technology Law Journal 2007), at 813.
[23] *Sky Technologies LLC v. SAP AG* [2009], 576 F.3d 1374.

CHAPTER ONE

KEY FEATURES OF PATENTS

1.1. INTELLECTUAL PROPERTY IN THE FORM OF PATENTS

In order to have a comprehensive understanding of the topic and its related issues, this section will define the key concepts from a theoretical perspective in order to explain the nexus between patents and secured transactions law in the following chapters.

Intellectual property (hereinafter: IP) law is an enlarging area of civil and commercial law, and it has nowadays become crucial both in developed and developing economies, especially from the point of view of its economic potential. IP is associated with the aims of promoting economic growth, innovation, and creativity. IP is fundamental for small and mid-scale enterprises (hereinafter: SMEs) for securing the benefits of their investment, since larger competitors might copy their innovation. By protecting their innovation and having exclusive rights granted for an invention for its production or sale, small companies including start-ups can prevent others to benefit from their efforts.[24]

IP law includes copyright, trademarks, trade secrets and patents. In simple terms, a patent in an exclusive right granted for an invention, whereas an invention has to bring novelty, usefulness, and non-obviousness to be patentable. Firstly, an invention is novel when it was not known nor disclosed to the larger public before the applicant filed for patent protection. Secondly, the invention must have a practical or specific purpose. Thirdly, the invention must be a non-obvious improvement over the prior art.[25] Other legal aspects of patents are important: the patent holder is

[24] ibid 6.
[25] ibid.

granted the negative exclusive right usually for a limited period of time (20 years) to stop others from producing, selling or using their invention, whereas these exclusive rights are territorial which only apply to the country where the registration of patents has been granted.[26] For the purpose of the thesis, it is important to understand not only the legal foundations of patents, but especially the economical ones. A simple look in the headlines of financial newspapers shows us supporting evidence of how valuable patents are.[27] Paradoxically, regardless of all indicators that confirm that patents are indeed valuable business assets, banks tend to not lend against patents and to not accept collateral in the form of patents, they do not even include patents in their calculation of risk reduction in secured financing.[28] This pattern can be observed especially in emerging jurisdictions for several motives. As the thesis will demonstrate, the lack of an adequate legal environment, particularly well-developed secured transactions laws, is undoubtedly one of the key reasons behind that. The other major factor is the lack of specialized markets where patents could be sold coupled with the failure of banks to understand the very nature and economic role of patents.

1.2. IDIOSYNCRATIC FEATURES OF PATENTS IN COMPARISON TO OTHER TYPES OF COLLATERAL

Patents are an effective policy tool of innovation encouragement.[29] In general terms, scientific knowledge is a public good and therefor has to be disclosed to the large public. Consequently, without the patentability of inventions patents would have no economic value and therefore they

[26] Organization for Economic Cooperation and Development (OECD), *European Commission-Eurostat – Patent Manual* (2009) < https://www.oecd.org/sti/inno/oecdpatentstatisticsmanual.html >, accessed 21 March 2020, at 24.
[27] David Cohen, *A Look at Facebook's Patent Acquisitions* (AdWeek 2014) < https://www.adweek.com/digital/envision-ip-patent-acquisitions/ > accessed 25 March 2020.
[28] Xuan-Thao Nguyen and Erik Hille, *Patent Aversion: An Empirical Study of Patents Collateral in Bank Lending, 1980-2016* (UC Irvine L Rev 2018), Vol. 9, at 141.
[29] Andaloro (n 6), at 6.

would not be seen as assets, since there would be no transaction possible which includes patents.[30] In comparison to other intangible collateral, patents and copyrights address the same goal: assuring income from investments in innovation and creative expression.[31] Similarly to patents, copyrights support licensing and assignability. On the other hand, trade secret law focusses on protecting the innovation through secrecy, while exploiting their invention over a longer time of period than a patent would permit, nevertheless bearing the risk that a disclosure of the secrecy might occur.[32] While patents protect the innovator against the public at large, trade secret law protects the secrecy of the information rather than the information itself.[33] Trademark law also focusses on a different goal than patents, that of protecting the integrity of the market-place. While patents speak of inventiveness, trademarks on the other hand speak of distinctiveness and depend on how consumers associate them with a source of goods in order for them to be successful.[34] In contrast, trademarks cannot be transferred as simply as patents, since their function is "to designate the goods as the product of a particular trader".[35]

When comparing patents to tangible assets, patents are information goods that can be shared also on a non-exclusive license base, allowing several parties to facilitate from the same asset, while in the case of tangible goods one party's possession excludes another party from possessing the same good.[36] The key distinguishable feature of patents is that once the patent is being sold or the patentee defaults from the payment of a loan, the debtor loses its right to exploit the patent for good. This might turn out to be vital for SMEs who do not possess any other tangible property,

[30] ibid.
[31] Menell (n 22), at 738.
[32] ibid 740.
[33] ibid 747.
[34] ibid 741.
[35] *United Drug Co. v. Theodore Rectanus Co*. [1918], 248 U.S. 90, 97.
[36] Wang (n 10), at 163.

because major shocks that will be suffered will make the operation of the business impossible. As opposed to that, if the collateralized asset is tangible property such as equipment or inventory, the defaulting debtor might still be in the position to produce the assets and sell them on the market. Thus, the debtor has a higher chance of surviving if the collateral is tangible. Therefore, patents require heightened attention and specific treatment by law.

1.3. PATENT-BACKED LENDING AS A FORM OF IP-BASED FINANCE

IP-backed lending refers to the usage of IP assets, herein patents, as collateral for companies that are seeking for a loan to a bank or another nonbank financial company (hereinafter: NBFC).[37] A collateral consists of an asset that the debtor of a loan pledges as assurance to secure the loan.[38] There are usually two scenarios in which patents are being used as collateral.[39] The first method consists of a lender extending credit to a borrower which pledges patents as collateral. Unless the lender perfects its security interest in the patent collateral, in the case of the borrower defaulting from the payment of the loan, he does not acquire a priority position and thus is unable to foreclose on the collateral for the purpose of recovering its losses. The second approach is known as securitization of IP assets. It consists of pooling intellectual property assets and issuing securities backed by those assets.[40] This thesis will examine the first method of patent collateralization.

Under U.S. secured transactions law, the in rem right granted by the debtor-owner of the asset to the creditor-lender to secure the underlying obligation is called a "security interest", which is

[37] Andaloro (n 6), at 23.
[38] Julia Kagan, *Collateral* (Investopedia) < https://www.investopedia.com/terms/c/collateral.asp> accessed 28 May 2020.
[39] Richard Ormond and Oren Bitan, *United States: How safe is Your Security Interest in Intellectual Property? Five Tips That Protect You* (Mondaq Business Briefing 2012) < https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:55SN-3J11-JCF5-V4BC-00000-00&context=1516831> accessed 28 May 2020.
[40] ibid.

actually a consensual lien[41] guaranteeing the creditor a clear priority position within and outside the context of bankruptcy. The legal ownership of the patent continues to be held by the original debtor unless he defaults. If the debtor defaults and fails to fulfill its payment obligation, the creditor can foreclose on the collateral and dispose of the collateral for the purpose of retrieving as much as he can from the payment of its loan and recover its losses.[42] In case the debtor fulfills its obligations or the patent is not being sold, upon termination of the security agreement, the rights in the patent collateral are returned to the original debtor by the process of issuing of a security release by the creditor.[43]

As an illustration of the importance of patent-backed lending of SMEs, the case of *Railex Corp. v. Joseph Guss & Sons, Inc* demonstrates that access to finance is crucial for small businesses.[44] As early as of 1961, Railex borrowed money from the United States Small Business Administration (SBA), a governmental agency which helps SMEs access financial help. The loan has been secured through a promissory note granting a security interest in Railex's patent, whereas the assignment of the patent would be null and void if Railex fulfilled its payment obligations. Before the promissory note has matured, Railex managed to repay the loan in full. In the meantime, Railex brought a patent infringement suit against Joseph Guss & Sons, which sought to dismiss the suit on the ground that the rightful owner of the patent is SBA. The court found that Railex had equitable title to the pledged patent due to the fulfillment of their obligation towards SBA and thus,

[41] Consensual lien referring to a lien created by agreement.
[42] U.C.C., § 9-610 (2010).
[43] A.C. Marco et al, *The USPTO patent assignment dataset: descriptions and analysis* (USPTO Working Paper 2015), No. 2015-2 < https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiZwLXJteHpAhWCxIsKHT2GDRAQFjAAegQIBBAB&url=https%3A%2F%2Fwww.uspto.gov%2Fsites%2Fdefault%2Ffiles%2Fdocuments%2FUSPTO_Patents_Assignment_Dataset_WP.pdf&usg=AOvVaw1WpWNnpDG3GW3XEverFrwb> accessed 28 May 2020.
[44] Railex (n 20), at 537.

SBA did not hold a security interest in the patent. Consequently, Railex had standing to bring the infringement suit against the defendant. The *Railex* case demonstrated that determining ownership positions of patents is not a fully established process. Consequently, uncertainty towards priority positions hinders creditors to extend credit by the usage of patents as collateral. On the positive side, the case demonstrates that governmental agencies such as the SBA play a necessary role for access to finance of SMEs by tailoring their financial opportunities to the special needs of companies who usually lack tangible property for the purpose of securitization of a loan. Finally, this acknowledgement is an affirmation that indeed patents are valuable assets in a SME's asset portfolio.

1.4. REASONS FOR THE UNDERUTILIZATION OF PATENTS AS COLLATERAL

Usually financial and NBFCs have expectations over the liquidity of the collateral, because in case of the borrower defaulting, lenders must foreclose in order to recover losses.[45] An asset is considered to be liquid when its value is easily transformed into cash. Large companies own physical assets such as real estate, plants, and equipment, therefore their access to finance is normally easier than for smaller companies which own rather intangible assets only such as patents. Even if small companies own patent-assets, patents are hard to be ex-ante valued, because the process of predicting future cash flow requires the patent has already brought positive revenue at the time of the collateralization.[46] In general, to deal with this indeterminacy, creditors tend to take security interests in patents with constant licensing royalties, in order to ensure a constant revenue stream for the repayment of the underlying debt.[47]

[45] Cavigiolli (n 15), at 3.
[46] ibid 4.
[47] ibid.

Nevertheless, due to valuation challenges, it has been confirmed that there are several factors that determine the liquidity of patents, such as the value of the underlying technology, their capability to be used in alternative ways when the patents are less firm-specific and their legal robustness.[48] Such factors determine the lending behavior. An empirical study focusing on information from the United States Patent and Trademark Office (hereinafter: USPTO) has looked at the factors that affect the outcome of a patent-backed loan and I believe their conclusion deserves to be briefly discussed.[49]

First and foremost, the study differentiates between lender's typologies. On the one hand, it refers to the practices of NBFCs of using patents as collateral and on the other hand, to the practices of banks. While it is obvious what banks are, NBFCs are financial institutions that are predominantly engaged in a financial activity, offering numerous banking services yet without having a banking license.[50] When acknowledging patents as valuable collateral, examining the behavior of NBFC's is significant, because it has been established that the existence of NBFC's in any given financial system, especially in the financial sector of emerging markets, makes a positive contribution to the economic growth and development.[51] Although it is true that banks are the principal financial service providers particularly in emerging markets, known to be mostly bank-based systems, banks are limited in their ability to offer high-risk services such as patent-backed loans.[52] Therefore,

[48] A. Shleifer and R. W. Vishny, *Liquidation values and debt capacity: a market equilibrium approach* (Journal of Finance 1992), Vol. 47, at 1343.
[49] Cavigiolli (n 15), at 2.
[50] James Chen, *Nonbanking Financial Companies (NBFCs)* (Investopedia) < https://www.investopedia.com/terms/n/nbfcs.asp> accessed 29 May 2020.
[51] Jeffrey Carmichael and Michael Pomerleano, The Development and Regulation of Non-Bank Financial Institutions (The World Bank, 2002), at 12 < http://documents.worldbank.org/curated/en/423061468780944527/pdf/multi0page.pdf> accessed 5 May 2020.
[52] ibid at 15.

banks are not sufficient for assuring financial efficiency and accordingly, NBFC's are essential financiers in providing financial diversity.[53]

The study itself examines the features which make patents more attractive to potential lenders. The result suggests that it is more likely that specialized NBFCs prefer younger patents collateral owned by larger borrower-companies. These findings are intriguing, since young, immature, patents are usually associated with uncertainty in their scope of application coupled with imperfect entrepreneurial financial markets.[54] Nevertheless, the fact that lenders prefer larger start-ups shows that the risk of uncertainty about patent scope is being mitigated by choosing to finance companies with "more credible signals about the quality of their innovation". Moreover, the underlying technology and a higher technical merit, not necessarily the exclusive rights of patents, affect the likelihood of NBFCs to consider patents as collateral. On the other hand, banks tend to not prioritize the technical merit of patents when a security interest in the patent is being released. Banks are more concerned compared to NBFCs about the default risk of borrowers and thus underestimate the potential of innovative patents.[55] In their defense, banks do not own rating systems for intangible information such as non-traditional lenders do. By being specialized in financing innovative ideas, finance companies possess knowledge in IPR evaluation and screening processes, which determine the capability of borrowers to exploit the underlying technology in the patent-collateral.[56] Also, banks are less experienced in the usage of patents as collateral than special financial institutions, therefore they do not possess developed selection capabilities.

[53] ibid at 16.
[54] Gili Greenberg, *Small Firms, Big Patents? Estimating Patent Value Using Data on Israeli Start-ups' Financing Rounds* (EMR 2013) < https://onlinelibrary.wiley.com/doi/abs/10.1111/emre.12015> accessed 29 May 2020.
[55] ibid.
[56] ibid 5.

The lesson that can be drawn for emerging market is that NBFCs which specialize in evaluating intangible property are important actors on the market, allowing a better development of selection capabilities and thus furthering an early access to credit for SMEs who rely mostly on intangible property such as patents especially in the beginning phase of their business. NBFC's would complement banks by providing services that are not well suited to banks, consequently solving the service-asymmetry that occurs in predominantly bank-based financial systems, such as in the case of emerging markets. However, in order to avoid the risk of intensifying the fragile environment of emerging markets, the NBFC sector should be properly regulated.[57] Also, intermediaries such as brokers which operate in the market between buyers and sellers of intellectual property have not only the role of protecting the market of intellectual property, but to further aggregate it. By treating patents as transactional assets, they would draw important precedents in terms of complex evaluation systems of patents. Therefore, I believe emerging markets need not only to accelerate legislation that addresses the collision between secured transactions law and IP law, but also to regulate the role of intermediaries. By doing so, the patent market would "further mutate, bringing about new services and entities of previously unseen nature."[58]

As an overall conclusion, a patent in an exclusive right granted for an invention. Patents are valuable intangible assets which are being used as collateral for companies that are seeking a loan from a bank or a NBFC. Nevertheless, the tendency is to not accept collateral in the form of patents because their ex-ante value is hard to be established. Factors which nurtures the practice of using patents as collateral are the underlying technology and a higher technical merit, not necessarily the

[57] Carmichael and Pomerleano (n 51) at 18-19.
[58] Wang (n 10), at 200.

exclusive rights of patents. The key lenders prove to be specialized NBFCs rather than banks, because NBFCs have better patent evaluation, risk assessment and screening mechanisms and in general turn out to be more experienced investors.

Further, the key distinguishing feature of patents when compared to other assets is that once the patent is being sold or the patentee defaults from the payment of a loan, the debtor loses its right to exploit the patent. In other words, in the absence of other tangible assets, SMEs disappear from the market for good. Therefore, patents deserve a special treatment by law. Emerging markets need to understand the correlation between IP law and secured transactions law, since the U.S. jurisprudence demonstrates that determining ownership positions of patents is crucial for creditors when seeking to enforce their security rights. Also, governmental agencies such as the SBA prove to be important actors, since they respond to specialized needs of small companies who do not necessarily have a credit history and need a recognition of their intangible property such as patents as valuable assets. Most importantly, governmental agencies would have a platform for lobbying of governmental programs such as special tax treatments that would allow access to financing to the benefit of SMEs.

CHAPTER TWO

HOLISTIC UNDERSTANDING OF PATENT-COLLATERALIZATION: THE PRACTICE OF USING PATENTS AS COLLATERAL

2.1. HISTORICAL BACKGROUND: SHIFTING FROM PATENT MORTGAGES TO SECURED TRANSACTIONS

On the 27th of January 1880, a patent has been used for the first time as collateral in the United States. If it does spark an idea, indeed it was Thomas Alva Edison who used the patent on his invention of the incandescent electric bulb to secure financing and raise debt for the purpose of starting his own company, the General Electric Company.[59] Only eleven years later, in 1891, the United States has encouraged the financial industry to provide financing to entities with patents that could be used as chattel mortgages in the famous case of *Waterman v. Mackenzie*.[60] The equitable powers of U.S. courts allowed them to borrow the concepts of mortgage law practices in which property served as security that was not real estate, precisely the concepts of chattel mortgages, for nonpossessory secured transactions.[61]

Mrs. Waterman borrowed money from Asa L. Shipman & Sons in 1884. The payment of the promissory note was secured by Mrs. Waterman with a mortgage on the patents related to the inventions of fountain pens, which were gained by her husband through a conditional assignment.[62] The agreement stated that the assignment is null and void if the payment obligation was paid on due date. Shipman recorded the patent mortgage with the Patent Office.[63] In the meantime, the

[59] Gene Quinn, *Thomas Edison and the Electric Lamp, Patented Jan. 27, 1880* (IPwatchdog 2014) < https://www.ipwatchdog.com/2014/01/26/thomas-edison-and-the-electric-lamp-patented-jan-27-1880/id=47529/ > accessed 1 April 2020.
[60] Waterman (n 21), at 258.
[61] ibid 260.
[62] ibid 257.
[63] ibid.

mortgagor transferred the patent ownership to his wife who began the production of the pens. A short period after, the mortgagor, Mrs. Waterman, brought an infringement suit against an alleged infringer. He challenged the suit for lack of standing since the patents had already been mortgaged.[64] The condition under the assignment agreement has not been fulfilled at the time of the infringement suit. The question the Court had to answer was whether the recording of the patent mortgage with the Patent Office gave the mortgagee, Shipman, title in the patent. The Court ruled in the affirmative, noting the following:

> "a recording of the mortgage is a substitute for, and (unless in case of actual fraud) equivalent to, a delivery of possession, and makes the title and the possession of the mortgagee good against all the world [as well as against the mortgagor]".[65]

Consequently, the mortgagor, Mrs. Waterman, had no standing because the patent has already been mortgaged to Shipman. The rightful claimant of the infringement suit was the mortgagee, Shipman. In other words, the court held that the nature of a document transferring an interest under a patent "does not depend on the name by which it calls itself, but on the legal effect of its provisions."[66]

The case teaches us important lessons. First, creditors were willing to secure the payment of the underlying debt by taking patents as collateral which serve as security.[67] Second, a proper recording of the patent with the Patent office gave the mortgagee a security interest in the patent.[68] Third, mortgagees can seek infringement suits against potential infringers of the patents, since the

[64] ibid 252.
[65] ibid 260.
[66] ibid 256.
[67] ibid 261.
[68] ibid.

security interest in the patent has an *erga-omnes* effect.[69] In other words, the mortgagee-creditor can pursue to collect the underlying obligation of the loan in case the initial mortgagor-debtor defaults by maintaining infringement suits, therefore he can reduce its exposure drastically.[70] Prior Uniform Commercial Code (hereinafter: UCC) Article 9 the secured party needed to demand assignment of patents later-on returning the patent to the debtor upon satisfaction of the obligation. The concept of mortgage law was borrowed to patent pledging, whereas the system worked by qualifying the mortgage as an equivalent for possession, whereas the possession of the debtor's patent was the perfection mechanism for the patent mortgages.[71] The U.S. courts of equity have played a crucial role for providing public notice on the "pledged" patent collateral by borrowing concepts of mortgage law to the constantly shifting needs of both lenders and borrowers of IP rights. As a consequence, the possibility to acquire an entire title in patents by the mortgagee, both in law and in equity, has elevated intellectual property to serve as collateral. The adoption of rules of equity in the area of chattel mortgage financing must be understood as an innovative process since it helped the lending based on patents develop and spread.[72]

The modern financing law was born and consequently the popularity of using intellectual property (hereinafter: IP) instruments as collateral has increased significantly due to the promulgation of the Official Text of Article 9 of the UCC, more precisely in its second version.[73] UCC Article 9 governs the security interest in assets that qualify as personal property.[74] Even though UCC Article 9 does not explicitly cover intellectual property assets, they are considered general intangibles

[69] ibid.
[70] ibid.
[71] Nguyen (n 5), at 527.
[72] Waterman (n 21), at 514.
[73] The UCC was promulgated in 1952, however the Official Text of Article 9 became available officially in 1962, allowing States to adopt it.
[74] Raymond T. Nimmer, *Revised Article 9 and Intellectual Property Asset* Financing (L. Rev. 2001), Vol. 53, at 308.

under the definition of UCC Article 9 and thus personal property.[75] The novelty was brought by a unitary system of secured transactions law with a functional approach in the sense that it eliminated distinctions between security devices in favor of a single security interest and a unitary mechanism for the creation and perfection that govern any type of transaction related to personal property.[76] Consequently, it amplified the process of securing financing using intellectual property such as patents, which constitute valuable assets for any entity in contemporary times. The practice of patent mortgages was no longer necessary, since the debtor continues to exploit and own the title of the collateralized patents assuring the ongoing operation of the debtor's business, while the secured creditor enjoys adequate protection of their security interest. Allowing the debtor to continue the operation of its business ensures a constant cash flow which guarantees the payment of the underlying debt to the secured creditor.[77]

2.2. CREATION, ATTACHMENT AND PERFECTION OF SECURITY INTERESTS IN PATENTS IN ACCORDANCE TO ARTICLE 9 UCC AND WITH RELEVANT PATENT LAW

2.2.1. CREATION AND ATTACHMENT OF SECURITY INTERESTS IN PATENTS

The rules of UCC Article 9 apply for the creation and attachment of security interest in intellectual property such as patent. In order for a security interest to be enforceable against the debtor and third parties, UCC Article 9 requires that (1) value must be given while (2) the debtor must have rights in the collateral and the condition of (3) a security agreement that provides description of collateral and granting language is met.[78] It simply means that the lender-creditor is granted a

[75] UCC Article 9, Section 102 (a) (42).
[76] Nguyen (n 5), at 526.
[77] Harold R. Weinberg & William J. Woodward, Jr., *Easing Transfer and Security Interest Transactions in Intellectual Property" An Agenda for Reform* (KY. Law Journal 1990), Vol. 79, at 65-66.
[78] Douglas K. Clarke et al, *Perfecting Security Interests in Intellectual Property: Article 9, Federal IP Statues and Foreign Laws* (Strafford 2014), p 2 < https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi_xuiMsOHpAhWkzoUK

security interest by the debtor by attaching assets of the debtor that serve as collateral for the underlying obligation of the loan payment. Without perfection, what a creditor gets is only an unperfected security interest without acquiring a priority position. Not only conventional, tangible property is referred to, but also intellectual property.[79] UCC Article 9 also allows after-acquired collateral to be attached, even the so-called "floating lien" over all of a debtor's assets as collateral.[80] The purpose of these mechanisms is to ensure that creditors have sufficient means to satisfy their claims in case the borrower defaults, while also acquiring a priority position within and outside the context of bankruptcy proceedings against other creditors.[81] The purpose of attaching after-acquired property is to accommodate a constantly changing asset pool for the needs of creditors and to reduce the cost of filing by the use of a single UCC-1 form which needs to be filed only once.[82] On the contrary, IP assets due to their intangible nature and the possibility of frequent development, are estranged to the concept of after-acquired property.[83] Thus, when collateralizing IP rights, after-acquired property leaves creditors in an unfortunate situation – that of having their rights unsecured. If work is done into improving a patent, the new resulting product will not be covered by the first IP registration and hence not be encompassed by UCC Article 9.[84] For the purpose of creating a security right, it would be necessary to perfect each and every enlargement in separate security agreements, which obviously increases the cost of collateralization.[85]

HUbJCvYQFjAAegQIBRAB&url=http%3A%2F%2Fmedia.straffordpub.com%2Fproducts%2Fperfecting-security-interests-in-intellectual-property-article-9-federal-ip-statutes-and-foreign-laws-2014-10-16%2Freference-material.pdf&usg=AOvVaw2X-YEtytKWr0Mi-YFVsmqt> accessed 29 May 2020.

[79] Menell (n 22), at 814.

[80] ibid.

[81] ibid.

[82] Anjanette H. Raymond et al, *Use of Intellectual Property as Collateral in Secured Financing: Practical Concerns* (Comparative Law Yearbook of International Business 2010), at 534.

[83] ibid.

[84] ibid.

[85] UNCITRAL (n 9) at 83.

2.2.2. PERFECTION OF SECURITY INTERESTS IN PATENTS: CONFLICTING LEGAL REGIMES

Within the nature of the functional approach of UCC Article 9, the provisions also govern the perfection of security interests in intangible property such as patents.[86] The function of perfection is to make the security interest valid against the entire world[87], thus granting creditors a priority position both within and outside the context of bankruptcy. As a consequence of perfection, secured creditors have superiority over unsecured creditors, or over secured creditors who have perfected their security interest on a later point in time.[88] UCC Article 9 recognizes four perfection forms, namely perfection through possession or control, a few instances of automatic perfection and filing as the most typical perfection method. Otherwise the perfection mechanism set in UCC Article 9[89], such as in the case of patents, requires creditors to file a financial statement recording the security interest under the name of the debtor in the state recording office.[90] The purpose of filing corresponds with the principle of publicity: prospective lenders should be able to verify if the asset they seek to subsequently attach is already encumbered with an attached security interest.[91] The UCC Article 9 filing system works by granting a higher priority to the creditor who first satisfies this requirement.

Due to their intangible nature, a security interest in IP rights cannot be perfected through the means of possession on the asset.[92] IP rights also do not qualify as types of collateral which can be

[86] Clarke (n 78), at 2.
[87] A security interest is an in rem security right, herein meaning that the right in the property is conclusive against all the world, see West's Encyclopedia of American Law (2008) < https://legal-dictionary.thefreedictionary.com/in+rem > accessed 25 May 2020.
[88] Hayes (n 2); unless creditors have a security interest that qualifies as a purchase-money security interest (PMSI).
[89] UCC Article 9 – 102.
[90] Menell (n 22), at 815.
[91] ibid.
[92] Ariel Glasner, *Making something out of "nothing" – The trend towards securitizing intellectual property assets and the legal obstacles that remain*, (J. of Legal Tech. Risk Management, Kindle edn. 2008), Vol. 3, at 56.

perfected by acquiring control over the assets.[93] Therefore, the perfection of copyrights, trademarks and patents must be completed by filing. In the following, the thesis will scrutinize the issues related to the perfection mechanism of patents. The main related dilemma stems from the fact that it is unclear, whether UCC Article 9 or federal patent statutes control the perfection mechanism. The exceptions found in UCC Article 9[94] refer to the federal intellectual property laws such as the Patent Act[95]. The Patent Act governs all cases of registering patent in the United States Patent and Trademark Office (hereinafter: USPTO).[96] The Patent Act does not expressly preempt UCC Article 9 from applying.[97] The Act discusses the ownership and assignments of patents, establishing that a recording with the USPTO is a first evidence of an execution of an assignment, grant or conveyance of a patent.[98] An assignment is defined as a transfer by a party of all or part of its right, title and interest in a patent.[99] The assignment requires that "the transfer to another must include the entirety of the bundle of rights that is associated with the ownership interest".[100] The Patent Act also states that an assignment, grant or conveyance shall be void against any subsequent purchaser or mortgagee without prior notice, unless the patent is recorded with USPTO within three months calculated from the date of the subsequent purchase or mortgage.[101] The case of *Waterman v. Mackenzie*[102] thought us that the perfection of security interests in patents under the USPTO was sufficient, a UCC filing not being additionally required. It was only in 2001 when

[93] UCC Article 9 - 314.
[94] UCC Article 9 - 109 (c) (1) and 311(a) (1).
[95] United States Code Title 35 – *Patents* [2019].
[96] Alicia Griffin Mills, *Perfecting Security Interests in IP: Avoiding the Traps* (The Banking Law Journal 2008), at 748.
[97] See U.S. Code Title 35, Section 261 (n 95); Menell (n 22), at 819.
[98] U.S. Code Title 35, Section 261 and 301 (37) (n 84), and Mills (n 96), at 748.
[99] ibid Section 301.
[100] ibid.
[101] Mills (n 96), at 748.
[102] Waterman (n 21), at 260.

the case of *In re Cybernetic Services, Inc.*[103] dealt with the question of whether the Patent Act preempted UCC Article 9. The bankruptcy court looked at whether a traditional transfer of ownership "assignment" of a patent in accordance with the Patent Act is understood as a grant of a security interest. If the court would have ruled in the affirmative, the Patent Act would have preempted UCC Article 9.[104]

In general, it is legitimate to ask ourselves this question, because the provisions differ based on where patents must be recorded and how priority is being accorded. For example, there is a statutory duty to record patents themselves with the USPTO including to whom the title on the patent belongs to. Yet, the USPTO does not subject a security interest created on a patent to mandatory registration with the patent register.[105] The federal Patent Act[106] does not stipulate in its provisions the priority issues either, since it does not follow the first-to-file rule for determining the priority among creditors either.[107] In other words, the recording system exposes potential lenders to a much higher risk than the UCC Article 9 filing system does, since even a diligent subsequent lender might not be able to determine if the patent has already been encumbered by a lien. The bankruptcy court in *In re Cybernetic Services, Inc.* ruled that the reach of the Patent Act was limited to regulating ownership interests in patents.[108] Hence, only a UCC Article 9 statement filing perfects a security interest in patents and grants priority thereof as against to subsequent lenders.[109]

[103] *Moldo v. Matsco, Inc. (In re Cybernetic Inc.)* [2001], 252 F. 3d 1039.
[104] Mills (n 96), at 748.
[105] Clarke (n 78), at 3.
[106] U.S. Code Title 35 (n 95).
[107] Menell (n 22), at 816.
[108] *In re Cybernetic Inc.* (n 103), at 1056.
[109] Clarke (n 78), at 3.

While the UCC Article 9 filing is necessary to perfect a security interest in patents, the courts found in the case of *Rhone-Poulence Agro*[110] that a UCC Article 9 filing does not protect against bona fide purchasers of patent rights. In other words, a bona fide purchaser with a recorded right at the USPTO has priority over a secured creditor who has filed its interest right on the patent only in accordance to UCC-1 and failed to do so with USPTO.[111] Accordingly, even though filing with USPTO has no legal effect with regards to perfection of a security interest, creditors are advised in practice to make such a filing since the USPTO filing will serve as notice to a subsequent purchaser.[112]

2.2.3. DEVELOPING THE PERFECTION MECHANISM IN PATENTS: LESSONS FOR EMERGING MARKETS

The previous case should alarm emerging markets in regards with the collision of IP law and secured transactions law and the uncertainty it generates. In federal systems, it is crucial to develop federal and state laws that co-exist with each other and do not concur. Nonetheless, statutes should clearly determine where and how to file, what type of collateral is covered by a security interest and who has priority both within and outside the context of bankruptcy. A centralized filing system for all types of intellectual property allows the advantage of certainty and simplicity as opposed to a fragmented one.[113] Confusion with the applicability of laws raises the costs of transactions, since lenders choose the dual-filing system of their patents for "extra precaution".[114] The issue of bona fide purchasers should also be tackled, since the US practices shows us that a creditor is advised

[110] *Rhodes-Poulence Agro, S. A. v. DeKalb Genetics Corp.* [2002], 284 F. 3d 1323.
[111] Mills (n 96), at 748.
[112] Scott J. Lebson, Security Interests in Intellectual Property in the United States: Are They Really Secure? (Ladas & Parry Education Center 2014), at 9 < https://ladas.com/education-center/security-interests-intellectual-property-united-states/> accessed 5 June 2020.
[113] Menell (n 22), at 822.
[114] Nguyen and Hille (n 28), at 148.

to record a security interest both accordingly with the UCC and with the USPTO to protect itself against subsequent purchasers.[115] Cautiousness is recommended due to the conflicting legal regimes. As far as the situation of European countries goes, i.e. in Germany, it is mandatory to register pledges with the relevant patent office.[116] In addition, there are no registers for security interests on movable property which also includes patents.[117] Therefore, the situation seems clearer in comparison to the US perfection mechanism.

While Menell states that emerging markets should care to implement "a universal security interest database for all forms of intellectual property "[because] [such] system better comports with the inherently intangible and dynamic nature of intellectual property"[118], this is only partially an effective panacea. Copyrights can be registered or unregistered, therefore a universal solution might not provide proper remedy when tackling the issues of perfection mechanisms.[119] Even though the recognition and enforcement of copyrights arise upon creation, some scholars argue that this aspect is not necessarily a virtue and accordingly call for the reintroduction of formalities for the purpose of bringing clarity to copyright entitlements.[120] Yet, this issue does not arise in relation to patents, thus an universal security interest database could be a viable solution for emerging markets when developing both their secured transactions, as well as their IP laws.

[115] Mills (n 96), at 749.
[116] European Patent Academy, *Patent litigation: The effects of licenses under patents* (Patent litigation 2015), Vol. 2, at 6 < https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjAxdH8s-HpAhVFiIsKHRjKCWcQFjAAegQIBRAB&url=https%3A%2F%2Fe-courses.epo.org%2Fwbts_int%2Flitigation%2FLicences.pdf&usg=AOvVaw22We8FOxYnT8LPGnw6MpL_ > accessed 28 May 2020.
[117] Phillip R. Wood, *Comparative Law of Security Interests and Title Finance* (Sweet & Maxwell 2007), Vol. 2, point 9-040.
[118] Menell (n 22), at 822.
[119] Mills (n 96), at 751.
[120] Dev S. Gangjee, *Copyright Formalities: A return to registration?* excerpt taken from *What if we could reimagine copyright?* (ANU Press, 2017) at 213.

CHAPTER THREE

RISKS COROLLARY TO USAGE OF PATENTS AS COLLATERAL: FROM ENFORCEMENT METHODS TO INFRINGEMENT LIABILITY AND PATENT LICENSING

3.1. ENFORCEMENT OF A SECURITY INTEREST IN PATENTS: FORECLOSURE SALE AND STRICT FORECLOSURE

In the words of Bramson as stated in 1981, "it was felt that patents […] were purely personal privileges that could not be reached by creditors. That is no longer true."[121] Upon default by the borrower, a secured creditor has the immediate right to repossess the patent collateral. After seizing the patent, the secured creditor has two possible choices under UCC Article 9. First, the creditor has an immediate right to foreclose on the patent by selling it in a commercially reasonable manner[122], and to collect the proceeds to which it is entitled.[123] Second, if the creditor wants to fully or partially retain rather than sell the patent in satisfaction of the debt, he may request it in writing, whereas the debtor[124] has the right to object within 20 days after transmittal of the proposal[125]. This procedure is called "strict foreclosure".[126]

Foreclosure of an intangible asset such as a patent seems challenging, since the "normal" practices applicable to tangible property can hardly be applied. With tangible property such as equipment or inventory, the secured creditor can rely on self-help repossession as long as it is conducted

[121] Robert S. Bramson, *Intellectual Property as Collateral – Patents, Trade Secrets, Trademarks and Copyright* (Bus Law 1981), Vol. 36, at 1567.
[122] The foreclosure sale can be done either through a public auction or private sale, see UCC Article 9 – 627.
[123] Raymond T. Nimmer and Patricia A. Krauthaus, *Secured Financing and Information Property Rights* (High Technology Law Journal, 1987), Vol. 2, Nr. 2, at 220. The collection of proceeds is found under UCC Article 9 – 315 and 607 (a) (2).
[124] Or a person to which the secured party was required to send notice or any other person holding a subordinate interest in the collateral as in UCC Article 9 – 620 (a).
[125] UCC Article 9 – 620 (a) and (c).
[126] Nimmer and Krauthaus (n 123) at 220.

without breaching the peace.[127] The meaning of the breach of peace has been explained by several courts such as in the case of *Giles v. First Virginia*.[128] Instead, the creditor can also obtain a judicial order to repossess the collateral. It is self-explanatory why self-help repossession cannot be applicable when it comes to intangible collateral such as patents. Further, I will be discussing the practice related to the foreclosure sale of patents, which also draws conclusions for the strict foreclosure procedure.

The collision between intellectual property (hereinafter: IP) law and secured transactions law yet again surfaces in this context, because the secured creditor might be required to request an assignment from the defaulting borrower in order to repossess and sell the patent, hence a transfer of title in accordance to the Patent Act[129], whereas the borrower would have the obligation to firstly record the assignment with the United States Patent and Trademark Office (hereinafter: USPTO).[130] This scenario would hinder the creditor from enforcing its rights.

Motivated by this challenge, the court in the case of *Sky Technologies v. SAP* have contributed to the understanding of foreclosure sale in case of patents.[131] At a foreclosure sale, for the purpose of recovering as much as possible on a loan, the secured creditor sold the patent at a public auction. A third-party purchased the patent, without the initial defaulting debtor executing a written assignment for its transfer of ownership rights in the patent.[132] Shortly after, that same third party has assigned the patent to Sky Technologies, which then filed an infringement suit against SAP.[133] SAP moved to dismiss the complaint, arguing that the missing assignment between the initial

[127] Nyugen (n 5), at 539.
[128] *Giles v. First Virginia Credit Services* [2002], 560 S. E. 2d 557.
[129] U.S. Code Title 35 (n 95), Section 261.
[130] Nyugen (n 5), at 539.
[131] *Sky Technologies* (n 23), at 1372.
[132] Nyugen (n 5) at 540.
[133] ibid at 541.

debtor and the third-party in the wake of the foreclosure sale would leave a gap in the chain of title so that Sky Technologies is conclusively not the rightful owner of the patent.[134] The issue was whether a sale following foreclosure would transfer title "without restricting the transfer of patent ownership only by a written assignment".[135] The court found that title was transferred effectively at a foreclosure sale without the need of an assignment for the purpose of ownership transfer in the patent.[136] The policy justification as noted by the court states that any additional assignment would "negatively impact existing secured financing with patents as collateral, hinder future financing with patent collateral, and impose burden on transactions."[137] The lessons from this case are valuable, since the judgment strengthens the purpose of UCC Article 9: that of encouraging secured financing.[138] The issue might seem outdated, since UCC Article 9 reduces the importance of "title".[139] Hence, upon default, a secured creditor has an immediate right to take possession of the patent collateral, further on choosing between selling it on the market through a foreclosure sale or rather retaining the patent in satisfaction of the debt.

Emerging markets must focus their attention for developing better enforcement mechanisms and understand that the ruling of the case in *Sky Technologies v. SAP* does not only protect creditors, but especially the intellectual property market and the overlying rationale of secured transactions laws.

On the one hand, requesting the transfer of ownership rights on patents in the form of an assignment as an additional step for a proper repossession and hence, not throughout the operation

[134] ibid.
[135] *Sky Technologies* (n 23) at 1381.
[136] ibid at 542.
[137] ibid. See also Nyugen (n 5), at 542.
[138] Nyugen (n 5), at 542.
[139] Nimmer and Krauthaus (n 123) at 218.

of law, lowers the value of the patent collateral, because a transfer of ownership from the borrower to the creditor is equivalent to a pledge: the borrower can no longer use the patent upon assignment and generate future revenue streams from the information asset.[140] This scenario would also be aversive to the court ruling in *In Re Cybernetic* which concluded that even if the borrower would "pledge" its patent collateral in the form of an assignment for the purpose of ownership transfer with the USPTO, the creditor would not be granted a secured priority position unless he files a UCC-1 statement.[141] Thus, with regards to creditors repossessing the patent collateral, an ownership of patents by operation of law corresponds with the policy judgement in *In Re Cybernetic*. From a practical point of view, it also inevitably reduces costs the secured creditor might have to bear by demanding the assignment title in the patent collateral from the borrower.[142] The only understandable scenario where patents might be "pledged" in the form of an assignment for the purpose of ownership transfer is for the protection against bona fide purchasers if the emerging jurisdiction aligns with US practices.[143] In order for a creditor to enforce its priority position, he would need to file its security interest in the patent, and therefore assign for the purpose of establishing a security interest both with the USPTO and according to UCC Article 9. The German system has shown us that it is mandatory to register pledges with the relevant patent offices, consequently the failure to do causes any assignment to third parties for the purpose of ownership transfer to be unenforceable.[144]

[140] ibid.
[141] In re Cybernetic Inc (n 103), at 1056.
[142] ibid.
[143] Rhodes-Poulence Agro (n 110), at 40.
[144] European Patent Academy (n 116), at 6.

3.2. INFRINGEMENT LIABILITY

A secured creditor might be exposed to the risk of being liable for infringement in case the creditor acts as a lender to a borrower, whereas taking a security interest in the borrower's property which includes patents and then forecloses on the patent collateral which is subject of patent infringement suit claimed by a patentee against the borrower.[145]

While the risk of infringement liability is very rare, for the purpose of simplifying the issue I will succinctly address the case of *Van Well Nursery*.[146] Van Well owned a patent for a new apple tree variety and sold the patented trees to the public at large.[147] Van Well was seeking an extension of its patents against a mortgage lender. The mortgage lender is the defendant insurance company who loaned money to a farm for the purchase of a property containing the patented trees, securing the loan with the property collateral. The parties signed a mortgage agreement. Shortly after, the mortgagee farm defaulted on the loan and the insurance company proceeded with the foreclosure on the property used as collateral. Consequently, Van Well brought an infringement suit against the insurance company. The court ruled in favor of the insurance company, stating that "holding a lending institution liable for direct infringement […] would threaten the foundation of a dynamic, competitive, and stable economy".[148] As a general lesson for emerging markets, when drafting a security agreement proper language needs careful thought.[149]

[145] Nyugen (n 5), at 544.
[146] *Van Well Nursery, Inc. v. Mony Life Insurance Co.* [2005], 362 F. Supp. 2d 1223.
[147] ibid 1224.
[148] ibid 1230.
[149] Nyugen (n 5), at 548.

3.3. PATENT LICENSING

The opportunity of licensing the rights in patents and thus, commercializing them to other natural persons or companies, is a great way of small and mid-scale enterprises (hereinafter: SMEs) who do not have sufficient marketing capabilities to trade their knowledge and generate a high return of their initial investment.

In general terms, upon registration of a patent, the patentee has the exclusive right to use and exploit the patent, preventing other from using the patent during its term.[150] In order for others to use the underlying technology protected by the patent, the acquisition of a patent through a purchase agreement can be sought, or otherwise the licensing of a patent by the virtue of a license agreement.[151]

The EU Commission acknowledges the positive effects of patent licensing, stating "[license agreements] will usually improve economic efficiency and be pro-competitive as they can reduce duplication of research and development, strengthen the incentive for the initial research and development, spur incremental innovation, facilitate diffusion and generate product market competition."[152] Nevertheless, for the purpose of this paper, licensing agreements, both on an exclusive and non-exclusive basis, present an additional risk, impeding a lender to secure the payment of a loan by the usage of patents as collateral.

In general terms, a license agreement is an inter-partes agreement between a licensor and a licensee, allowing the licensee to gain access to the IP rights possessed by the licensor, in return

[150] WIPO – *Most Intermediate Training Course on Intellectual Property Issues in Business* (WIPO/IP/BIS/GE/03/04 2003), p 1 < https://www.wipo.int/meetings/en/details.jsp?meeting_id=5424&la=ZH> accessed 29 May 2020.
[151] European Patent Academy (no 116), at 1.
[152] EU Commission, Recital (4) of Commission Regulation No. 316/2014.

for a remuneration.[153] Most importantly, once the licensor grants a license, the license attaches to the patent or patent application.[154] Therefore, the underlying licensed patent can serve as collateral asset within the meaning of UCC Article 9. Further, I will observe the impact of patent licensing on the process of collateralization of patents. Even though there are multiple variations of licensing agreements, such as sole or hybrid licensing, this paper will deliberately focus on exclusive and non-exclusive licensing agreements, with an additional explanation of how sub-licensing might also present a risk for the enforcement mechanism.

3.3.1. EXCLUSIVE LICENSING

Under the U.S. Patent Act and European Patent Law, if the licensor chooses to license its patent on an exclusive basis, he transfers the ownership of the patent, while keeping the title to the patent.[155] An exclusive license means that no other natural or legal person other than the licensee may use the patent, not even the patentee.[156]

The process of granting further licenses by the licensee to other third parties is known as sub-licensing.[157] In general, sub-licenses are valid only if the main license agreement permits the licensee to grant them.[158] A peek in the European Patent legislation shows us that the question of whether or not the license agreement authorizes licensees to grant further sub-licenses to third parties differs based on what law applies to the license agreement. For instance, under English Law, the license agreement has to specify the authorization of sub-licensing, while German Law finds itself on opposite poles.[159] The risk associated with exclusive licenses is the creation of a

[153] European Patent Academy (no 116), at 1.
[154] ibid.
[155] Justia, *Intellectual Property* < https://www.justia.com/intellectual-property/> accessed 29 May 2020.
[156] European Patent Academy (no 116), at 8.
[157] ibid 9.
[158] ibid.
[159] ibid.

chain of patentees which can lead to a rather difficult enforcement of security interests in patents collateral, depending on which law applies to the license agreement. Emerging markets should be particularly cautious when developing IP regulations, because it might draw potential financial opportunities away especially when exploiting IP as a valuable collateral.

3.3.2. NON-EXCLUSIVE LICENSING

When the license is granted on a non-exclusive basis, the patentee remains entitled to use the patent or grant additional licenses to other third parties.[160] Therefore, a patentee is entitled to sell and transfer title of the patent to any third party. The threat of sub-licenses does not appear in the case of non-exclusive licensing of patents, because the license agreement must explicitly state the authority to do so.[161]

From one point of view, non-exclusive licensing represents an advantage for the collateralization of patents. Companies usually invest years of research in the innovative technology of their patents, while struggling to profit from it if they lack ways of commercializing their invention.[162] Licensing on a non-exclusive basis allows the patentee to gain a high rate of return from royalty revenue. In case the patentee would need to access financing opportunities, lenders would have a higher incentive to grant them credit secured by their patent given that the patent has a constant rate of return. The company itself would benefit from a raising market value, making therefore a default from the payment of the credit obligation less probable. From another point of view, the security rights in patents associated with non-exclusive licenses might represent an additional risk under the application of UCC Article 9.[163] It is questionable if UCC Article 9 covers the scenario

[160] ibid.
[161] ibid.
[162] WIPO (n 150), at 1.
[163] Glasner (n 92), at 53.

of lenders who are being granted a security interest in the patents arising under a non-exclusive license agreement. As mentioned above, UCC Article 9 covers only personal property rights.[164] When patents are being exploited on a non-exclusive basis, the licensee does not have any property rights in the patented work, unless the patentee transfers title under the license agreement explicitly over the copies of the licensed work.[165] As a consequence, creditors would be unable to obtain a security interest, unless the non-exclusive license agreement stipulates the transfer of ownership to the patentee.[166] This might lead to a higher cost of due diligence of creditors who would need to verify to what extent licensees possess such rights.

[164] Nimmer (n 74), at 308.
[165] ibid.
[166] Glasner (n 92), at 54.

CONCLUSION

My research investigated intellectual property in the form of patents as a credit tool with a special devotion to small and mid-scale enterprises (hereinafter: SMEs) related issues. Even though the usage of patents as collateral is hardly novel, the practice has limited success due to a variety of juridical and economic reasons I have attempted to observe in my thesis.

The macro-perspective of the research question evolves around the interaction of secured transactions law with intellectual property (hereinafter: IP) rights such as patents which proves to be challenging especially for emerging markets. The reason for the complexity of the issue lies in the fact that IP rights possess unique features which demand for a specialized treatment of patents. From an economic point of view, a patent collateral has impactful consequences on defaulting debtors, because they could potentially lose the most valuable asset their enterprise is based on against secured creditors. Therefore, patents deserve a special treatment by law.

My thesis demonstrates that U.S. courts have found remedies in equity, borrowing the concept of mortgage law to patent pledging.[167] The qualification of the mortgaged patent collateral served as an equivalent for possessing the patent and thus allowed creditors to perfect their security interest through the means of possession.[168] Prior to the UCC Article 9, the secured party needed to demand assignment of patent and later-on returning the patent to the debtor upon satisfaction of the obligation. As a consequence, U.S. courts of equity have played a crucial role for providing public notice on the "pledged" patent collateral serving the needs of both borrowers and lenders who relied on patents as a financial channel. The adoption of rules of equity in the area of chattel mortgage financing must be understood retrospectively as a tool of accelerating the development

[167] Waterman (n 21), at 258.
[168] Nguyen (n 5), at 527.

of patent lending.[169] Civil law countries do not know the concept of equitable powers of courts. Therefore, in civil law countries this issues must be solved by the implementation of prescriptive language regulations. This inevitably leads to a weaker discretion ability of civil law courts when deciding upon novelties such as patent collateral. This gap must not only be solved by legislative bodies but might also be filled by governmental agencies who possess a higher incentive for addressing the special needs of SMEs on the market. Other important actors are the nonbanking financial companies (hereinafter: NBFCs) who specialize in better patent evaluation, risk assessment and screening mechanisms in comparison to traditional banks and in general prove to be more experienced lenders. Also, intermediaries such as brokers which operate in the market between buyers and sellers of intellectual property prove to be protecting and strengthening the market of intellectual property.

Additionally, my thesis finds that the collision between IP rights and secured transactions law results in the U.S. from the conflicting perfection mechanisms of security interests in IP rights. Herein UCC Article 9 and federal patent law are conflicting, leaving courts to decide such as in the example of *In re Cybernetic Services, Inc.*[170] which laws govern the perfection of security interests in patents. The court found that the UCC Article 9 financial statement filing is necessary to perfect a security interest in patents and thus, federal patent law such as the Patent Act does not preempt UCC Article 9 from applying.[171] In respect with the rationale behind the court decision, I have canvased conclusive lessons for emerging markets in terms of how to file, where to file and how to assure that secured creditors gain priority over other creditors. Emerging markets might consider implementing a centralized filing system for all types of intellectual property, allowing

[169] Waterman (n 21), at 514.
[170] In re Cybernetic Inc. (n 103).
[171] Menell (n 22), at 819.

the advantage of certainty and simplicity as opposed to a fragmented system. Nevertheless, implementing a universal filing system proves itself as challenging when addressing the idiosyncratic features of copyrights. Moreover, the question of how IP rights relates to secured transactions law reappears in the context of enforcement of a security interest in patents. Yet again, as seen in the case of *Sky Technologies v. SAP*[172], the rationale of UCC Article 9 of encouraging secured financing prevails as opposed to the antique-pledge rationale of IP laws.

The thesis further analyzes in a micro-perspective all aspects related to the idiosyncratic features of patents in comparison to other collateral types, the implications of patent-backed lending such as reasons for the underutilization of patents. As a general tendency, lenders appreciate the underlying technology rather than the exclusionary rights of patents when deciding to assert to patents as collateral.[173]

The last chapter of my thesis demonstrates that risks of patent collateralization might not be so obvious for creditors who confront themselves with the issue of how to foreclose on the patent collateral. Furthermore, I chose to present the implications of patent licensing and infringement liability in connection with patent collateralization. The examples demonstrate how exclusive and non-exclusive licensing represent risks secured creditors are faced with when attempting to enforce their security rights in patent collateral. As a consequence, a proper understanding of these issues is vital for the development of a functioning IP market and for efficient secured transaction regimes of any given system.

The most promising lesson for emerging markets comes from United States Patent and Trademark Office (hereinafter: UNCITRAL). The Legislative Guide on Secured Transactions followed by the

[172] Sky Technologies (n 23), at 1374.
[173] Cavigiolli (n 15), at 2.

Supplement on Security Rights in IP serves as a model law aimed at jurisdictions who seek a legal reform and do not comprehend the implications of the co-ordination between a legal framework of secured transactions law on the one hand, and IP law on the other hand.[174]

To conclude with, access to financing for SMEs is crucial for their survival on the market, given the fact that they are developers of and survive from innovation. Financing on the basis of patent collateralization needs to be placed currently at the center of discussion because the IP market has a tremendous value that needs to be exploited by all actors on the market in a lawful way. As one critic has observed, "problems in valuing, measuring, and collateralizing intellectual property may exist, but intellectual property's newly realized commercial value will inevitably overcome such problems. There is simply too much money at stake to permit continued ambiguity in the use of intellectual property in commercial deals."[175]

[174] Tosato (n 4), at 746.
[175] Shawn K. Baldwin,*" To Promote the Progress of Science and Useful Arts": A Role of Federal Regulation of Intellectual Property as Collateral* (University of Pennsylvania Law Review 1995) Vol. 143 / 5, at 1737.

BIBLIOGRAPHY

TABLE OF LEGISLATION

E.U. Commission, Recital (4) of Commission Regulation No. 316/2014

Official Records of the General Assembly, Supplement Nr. 17 (A/61/17)

The UNCITRAL Legislative Guide on Secured Transactions (United Nations 2010)

The UNCITRAL Legislative Guide on Secured Transactions: Supplement on Security Rights in Intellectual Property (United Nations 2011)

U.C.C. Article 9 Secured Transactions (2010)

U.S. Code Tile 35 – Patents (2019), Section 261

CASES

Giles v. First Virginia Credit Services [2002], 560 S. E. 2d 557

In re Cybernetic Inc. [2001], *252 F. 3d 1039*

Moldo v. Matsco, Inc. (In re Cybernetic Inc.) [2001], 252 F. 3d 1039, 1056

Railex Corp. v. Joseph Guss & Sons, Inc. [1967], 40 F.R.D. 119

Rhodes-Poulence Agro, S. A. v. DeKalb Genetics Corp. [2002], 284 F. 3d 1323, 40

Sky Technologies LLC v. SAP AG [2009], 576 F.3d 1374

United Drug Co. v. Theodore Rectanus Co. [1918], 248 U.S. 90, 97

Van Well Nursery, Inc. v. Mony Life Insurance Co. [2005], 362 F. Supp. 2d 1223

Waterman v. Mackenzie [1891], 138 U.S. 252

BOOKS

Phillip R. Wood, *Comparative Law of Security Interests and Title Finance* (Sweet & Maxwell 2007), Vol. 2

JOURNAL ARTICLES AND PAPERS

A. Shleifer and R. W. Vishny, 'Liquidation values and debt capacity: a market equilibrium approach' (Journal of Finance 1992), Vol. 47, pp. 1343-1366

Alicia Griffin Mills, 'Perfecting Security Interests in IP: Avoiding the Traps' (The Banking Law Journal 2008), pp. 746-756

Allen W. Wang, 'Rise of the Patent Intermediaries' (Berkley Technology Law Journal 2010), Vol. 25, pp. 159-200

Andrea Tosato, 'The UNCITRAL Annex on security rights in IP: a work in progress' (4JIPLP 2009), pp. 743-750

Anjanette H. Raymond et al, 'Use of Intellectual Property as Collateral in Secured Financing: Practical Concerns' (Comparative Law Yearbook of International Business 2010), pp. 525-543

Ariel Glasner, 'Making something out of "nothing" – The trend towards securitizing intellectual property assets and the legal obstacles that remain', (J. of Legal Tech. Risk Management, Kindle edn. 2008), Vol. 3

C. A. Corrado, 'Intangible capital, and economic growth' (NBER Cambridge MA 2006)

Federico Caviggioli et al, 'Lender's selection capabilities, patent quality, and the outcome of patent-backed loans' (Industrial and Corporate Change 2019), pp. 43-60

Dev S. Gangjee, 'Copyright Formalities: A return to registration? excerpt taken from What if we could reimagine copyright?*'* (ANU Press, 2017) pp. 213-251

H. E. Leland and D. H. Pyle, 'Information asymmetries, financial structure, and financial intermediation' (The Journal of Finance 1977), Vol. 32, pp. 371-387

Harold R. Weinberg & William J. Woodward, Jr., 'Easing Transfer and Security Interest Transactions in Intellectual Property"' An Agenda for Reform (KY. Law Journal 1990), Vol. 79, pp. 63-134

Laurent Manderieux, 'Secured Transactions as a Tool for Better Use of Intellectual Property Rights and of Intellectual Property Licensing' *(including Patent Licensing)* (Unif L Rev 2010), Vol.15, pp. 447-457

Leonardo Andaloro, 'Patent as collateral – An empirical analysis on security agreements and patent value' (ResearchGate MA 2016)

M.A. Lemley, 'Reconceiving patents in the age of venture capital' (Journal of Small and Emerging Business Law 2000) Vol. 4, pp. 137-148

Peter S. Menell, 'Bankruptcy treatment of Intellectual Property Assets: An Economic Analysis' (Berkley Technology Law Journal 2007), pp. 733-823

Raymond T. Nimmer, 'Revised Article 9 and Intellectual Property Asset Financing' (L. Rev. 2001), Vol. 53, pp. 289-359

Raymond T. Nimmer and Patricia A. Krauthaus, 'Secured Financing and Information Property Rights' (High Technology Law Journal, 1987), Vol. 2, Nr. 2, pp. 195-228

Robert S. Bramson, 'Intellectual Property as Collateral – Patents, Trade Secrets, Trademarks and Copyright' (Bus Law 1981), Vol. 36, pp. 1567-1604

Shawn K. Baldwin, '" To Promote the Progress of Science and Useful Arts": A Role of Federal Regulation of Intellectual Property as Collateral' (University of Pennsylvania Law Review 1995) Vol. 143 / 5, pp. 1701-1738

Xuan-Thao Nguyen, 'Financing Innovation: Legal Development of Intellectual Property as Security in Financing, 1845-2014' (Ind L Rev 2015), pp. 509-550

Xuan-Thao Nguyen and Erik Hille, 'Patent Aversion: An Empirical Study of Patents Collateral in Bank Lending', 1980-2016 (UC Irvine L Rev 2018), Vol. 9, pp. 142-175

ONLINE SOURCES

A.C. Marco et al, 'The USPTO patent assignment dataset: descriptions and analysis' (USPTO Working Paper 2015), no. 2015-2 < https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwiZwLXJteHpAhWCxIsKHT2GDRAQFjAAegQIBBAB&url=https%3A%2F%2Fwww.uspto.gov%2Fsites%2Fdefault%2Ffiles%2Fdocuments%2FUSPTO_Patents_Assignment_Dataset_WP.pdf&usg=AOvVaw1WpWNnpDG3GW3XEverFrwb> accessed 28 May 2020

Adam Hayes, 'Article 9' (Investopedia), < https://www.investopedia.com/terms/a/article-9.asp> accessed on 29 May 2020

David Cohen, 'A Look at Facebook's Patent Acquisitions' (AdWeek 2014) < https://www.adweek.com/digital/envision-ip-patent-acquisitions/ > accessed 25 March 2020

Douglas K. Clarke et al, 'Perfecting Security Interests in Intellectual Property: Article 9, Federal IP Statues and Foreign Laws' (Strafford Webinar 2014) < https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwi_xuiMsOHpAhWkzoUKHUbJCvYQFjAAegQIBRAB&url=http%3A%2F%2Fmedia.straffordpub.com%2Fproducts%2Fperfecting-security-interests-in-intellectual-property-

article-9-federal-ip-statutes-and-foreign-laws-2014-10-16%2Freference-material.pdf&usg=AOvVaw2X-YEtytKWr0Mi-YFVsmqt> accessed 29 May 2020

European Patent Academy, 'Patent litigation: The effects of licenses under patents' (Patent litigation 2015), Vol. 2 < https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjAxdH8s-HpAhVFiIsKHRjKCWcQFjAAegQIBRAB&url=https%3A%2F%2Fe-courses.epo.org%2Fwbts_int%2Flitigation%2FLicences.pdf&usg=AOvVaw22We8FOxYnT8LPGnw6MpL_> accessed 28 May

Gene Quinn, 'Thomas Edison and the Electric Lamp, Patented Jan. 27, 1880' (IPwatchdog 2014) < https://www.ipwatchdog.com/2014/01/26/thomas-edison-and-the-electric-lamp-patented-jan-27-1880/id=47529/ > accessed 1 April 2020

Gili Greenberg, 'Small Firms, Big Patents? Estimating Patent Value Using Data on Israeli Start-ups' Financing Rounds' (EMR 2013) < https://onlinelibrary.wiley.com/doi/abs/10.1111/emre.12015> accessed 29 May 2020

Jeffrey Carmichael and Michael Pomerleano, The Development and Regulation of Non-Bank Financial Institutions (The World Bank, 2002) < http://documents.worldbank.org/curated/en/423061468780944527/pdf/multi0page.pdf> accessed 5 May 2020

James Chen, 'Nonbanking Financial Companies' (NBFCs) (Investopedia) < https://www.investopedia.com/terms/n/nbfcs.asp> accessed 29 May 2020

Julia Kagan, 'Collateral' (Investopedia) < https://www.investopedia.com/terms/c/collateral.asp> accessed 28 May 2020

Justia, 'Intellectual Property' < https://www.justia.com/intellectual-property/> accessed 29 May 2020

Organization for Economic Cooperation and Development (OECD), 'European Commission-Eurostat – Patent Statistics Manual' (Akapit 2009), < https://www.oecd.org/sti/inno/oecdpatentstatisticsmanual.htm.> accessed 21 March 2020

Richard Ormond and Oren Bitan, 'United States: How safe is Your Security Interest in Intellectual Property? Five Tips That Protect You' (Mondaq Business Briefing 2012) < https://advance.lexis.com/api/document?collection=news&id=urn:contentItem:55SN-3J11-JCF5-V4BC-00000-00&context=1516831> accessed 28 May 2020

Scott J. Lebson, Security Interests in Intellectual Property in the United States: Are They Really Secure? (Ladas & Parry Education Center 2014), at 9 < https://ladas.com/education-center/security-interests-intellectual-property-united-states/> accessed 5 June 2020

West's Encyclopedia of American Law (2008) < https://legal-dictionary.thefreedictionary.com/in+rem > accessed 25 May 2020

WIPO – 'Most Intermediate Training Course on Intellectual Property Issues in Business' (WIPO/IP/BIS/GE/03/04 2003) < https://www.wipo.int/meetings/en/details.jsp?meeting_id=5424&la=ZH> accessed 29 may 2020